ISSN 0036-0236, Russian Journal of Inorganic Chemistry, 2021, Vol. 66, No. 8, pp. 1055–1056. © Pleiades Publishing, Ltd., 2021.
Russian Text © The Author(s), 2021, published in Zhurnal Neorganicheskoi Khimii, 2021, Vol. 66, No. 8, pp. 937–939.

Sixth Interdisciplinary Scientific Forum "New Materials and Advanced Technologies"

M. A. Sevost'yanov[a], * and A. S. Lysenkov[a]

[a] *Baikov Institute of Metallurgy and Materials Science, Russian Academy of Sciences, Moscow, 119334 Russia*

**e-mail: cmakp@mail.ru*

Received March 31, 2021; revised April 1, 2021; accepted April 1, 2021

Abstract—The main results of scientific sessions at the Sixth Interdisciplinary Scientific Forum with international participation "New Materials and Advanced Technologies" were presented; the sections included: "Nanomaterials and nanotechnology"; "Inorganic functional materials"; "Construction materials"; "Biomaterials and technologies"; "Materials and technologies for green chemistry"; "New materials and technologies in oil and gas industry (gas, oil, energetics)." More than 700 scientists from Russia, Azerbaijan, Belarus, Kazakhstan, Moldova, Tajikistan, Uzbekistan, France, and Czech Republic took part online in the forum, which gave rise to both national and international contacts. Two hundred and twenty six oral reports were presented at the forum, and lectures by famous scientists were organized. Scientific sessions and round tables with participation of representatives of foundations, industries, and scientific journals were held; the foresight sections were devoted to problems of the development of new materials and their commercialization and coverage. The topics included in the program of the forum gathered members of various interdisciplinary research groups concerned with the creation of materials and their use in various sectors of economy, and also the representatives of industrial enterprises interested in the latest developments. The high level of scientific training demonstrated by Russian and foreign scientists at the forum and wide discussion of their original and significant results is an important basis for further development of materials sciences, introduction of advanced technologies, and successful implementation of important priority programs for the development of science and technology.

Keywords: interdisciplinary links, consortia with industry

DOI: 10.1134/S0036023621080258

The development of promising technologies and new materials is an important direction in all fields of industry, construction, energetics, agriculture, and medicine [1–4]. In recent years, tremendous progress has been made in the field of fundamental principles for the creation of new materials and advanced technologies, but the creation of more advanced and specialized materials and technologies still remains to be a challenge. Today, many discoveries and technological solutions arise at the junction of different fields of knowledge (are interdisciplinary) [5–9].

The forum was aimed at enhancing the cooperation between scientists engaged in different fields of science and at forming consortia with industries concerned with the fundamental principles for the creation and research of new materials and development of promising technologies. Materials are the steps of our civilization, and new materials serve as a springboard for a life-changing jump into the future. New or future materials are the basis of the entire surrounding material world. Advanced technologies are technologies that have found wide application in various fields of science and technology [10].

The goal of the forum was also to strengthen the interdisciplinary links in the scientific community and promote the integration of science and industry in Russia to create new materials and advanced technologies. The program of the forum included discussions of the fundamental principles of the creation of new materials and their application in industry and production. During the event, scientific sessions and round tables were held, which were attended by the representatives of foundations and industry; they were devoted to the development of the fundamental principles of the creation of materials and their commercialization [11].

The scientific sections were as follows:

"Nanomaterials and nanotechnologies" was devoted to methods for the synthesis of nanomaterials, the use of nanomaterials and nanocoatings in various industries, nanotechnological equipment, and modeling of nanoprocesses and nanostructures;

"Experimental methods for investigation of materials and structures": experimental studies of the characteristics and properties of materials at different structural levels, obtaining and processing of experimental data;

determination of the mechanical, physical, and operational characteristics of units, assemblies, and structural elements; prediction of the behavior of structures during operation based on experimental data;

"Biomaterials and technologies": cell technologies and tissue engineering in medicine, genomic and post-genomic technologies for creating drugs, bioengineering technologies, biomedical technologies, biosensor technologies, bioanalytic devices, pharmacology, biomaterials and products from them;

"Structural materials": structural materials used for the production of articles, structural elements, and machine parts for power load;

"Promising processes in metallurgy": beneficiation and processing of ore raw materials, processing of industrial waste and secondary raw materials, theoretical foundations of metallurgical processes, automation and modeling, production of metals and alloys, metalwork;

"Inorganic functional materials": new metal, ceramic, and composite materials including glasses, single crystals, and films for functional purposes; other inorganic materials with unique electrophysical, magnetic, optical, and other special properties and methods for their preparation and potential applications;

"Organic functional materials": new approaches in organic synthesis to obtain complex molecules, catalysis in organic synthesis, promising organic molecules and materials, organic and hybrid molecular systems;

"Additive technologies": 3D scanning and computer modeling for additive manufacturing, innovative materials for 3D printing, metal powder composites for additive manufacturing including new methods for the preparation of powder materials, innovative methods of additive manufacturing, post-processing, quality control;

"Health preservation of population: management technologies": organizational technologies of health preservation in health care and social, scientific, and education sectors; information technologies of health preservation; assessment of the efficiency of clinical technologies for health preservation;

"New materials and technologies in oil and gas industry, gas, oil, and energetics": use of new materials and technologies in gas- and oil-field exploration, surveying, well drilling, oil and gas extraction, organization of transportation of extracted resources, core and reservoir fluid analysis;

"Materials and technologies for agriculture": search for ecologically and biologically sound technological methods of agricultural production and their development and extension; tissue and cell biotechnologies; genomic and post-genomic technologies for the creation of biologically active compounds and agents, toxicology of cultivated plants in the environment, biologically active materials and products made from them for technological solutions for obtaining environmentally safe agricultural products;

"Materials and technologies for green chemistry": mild synthesis procedures; new reagents, methods, and technologies used for purification of contaminated natural and non-natural environments; biodiesel; energy saving.

The round tables were devoted to various problems in the development of the scientific complex and topical issues of scientific interdisciplinary cooperation, funds for financial and organizational support for fundamental and exploratory research, and scientometrics.

Oral reports at high scientific level on the topics of scientific sections were presented within the framework of the scientific sections of the forum.

The forum has become a traditional annual scientific event aimed at the development of new materials and promising technologies and interdisciplinary cooperation.

REFERENCES

1. L. H. Larry, RJ. Julian, and B. F. Michael, *New Materials and Technologies for Healthcare* (Imperial College Press, London, 2014).
2. M. Ashby and K. Jonson, *Materials and* Design (Butterworth-Heinemann, 2014). https://doi.org/10.1016/B978-0-08-098205-2.00009-3
3. Yu. S. Karabasov, *New Materials* (MISIS, Moscow, 2002) [in Russian].
4. K. A. Solntsev, O. A. Bannykh, Yu. V. Tsvetkov, and V.M. Ievlev, Priroda **12**, 3 (2019). https://doi.org/10.7868/S0032874X19120019
5. F. L. Matthews and R. D. Rawlings, *Composite Materials: Engineering and Science* (Woodhead Publishing, London, 1999). https://doi.org/10.1016/C2013-0-17714-8
6. G. I. Zagainov and G. E. Lozino-Lozinski, *Composite Materials in Aerospace Design* (Springer, Netherlands, 1996). https://doi.org/10.1007/978-94-011-0575-0
7. F. Cardarelli, *Materials Handbook* (Springer, London, 2018). https://doi.org/10.1007/978-3-319-38925-7
8. E. H. Kablov, Intell. Tekhnol. **2**, 41 (2016).
9. M. F. Ashby, H. Shercliff, and D. Cebon, *Materials: Engineering, Science, Processing, and Design* (Butterworth-Heinemann, Oxford, 2018).
10. G. F. Tereshchenko and A. V. Putilov, in *Proceedings of the Russian Congress "Chemical Industry", Moscow, 1999.*
11. Nauka i Zhizn'. www.nkj.ru/prtnews/39904/

Translated by L. Smolina